

SUMMARY
Klamath Network
Vegetation Classification and Mapping Projects
June 12-13, 2006
Redding, CA

Background:

The parks in the Klamath Network (KLMN) include Crater Lake National Park (CRLA) with 182,304 acres, Lassen Volcanic National Park (LAVO) with 106,372 acres, Lava Beds National Monument (LABE) with 46,700 acres, Oregon Caves National Monument (ORCA) with 484 acres, Redwood National and State Parks (REDW) with 112,512 acres, and Whiskeytown National Recreation Area (WHIS) with 42,503 acres. A vegetation map for WHIS was completed by Dr. John Stuart of Humboldt State University (HSU) in 2005. The NPS National Vegetation Mapping Program has funded a project at LAVO which will commence in 2006 and compare different spatial techniques. Geographic Resource Solutions (GRS) and the USGS will be working at LAVO. When referring to the Network, this cluster of parks as a management unit is meant and not the Inventory & Monitoring (I&M) Program. The I&M program is interested in this project as one of the base-line inventories, but is not responsible for managing each vegetation mapping project within the Network. The program is interested in collaborating as a partner with the Fire Program, the individual parks and the National vegetation mapping program to complete vegetation maps at all parks.

Synopsis of Main Points:

- 3 major information goals for vegetation map at all Network parks:
 - Summarize vegetation
 - Fuels/Fire data: cover, structure and composition.
 - Wildlife habitat data: cover, structure and composition.
- Proposed plan for unfinished parks: Geographic Resources Solutions (GRS) will perform the fieldwork and GIS portions of the REDW map. Either HSU or the California Native Plant Society (CNPS) will perform the classification. Dennis Odion and Andy Duff out of Southern Oregon University will complete the vegetation maps for CRLA, LABE and ORCA.
- A Network Proposal will be submitted to the National Vegetation Mapping Program by the end of FY06 with a complete timeline and budget for all KLMN parks. The proposal will be completed by Susan O'Neil with significant input and review by park staff, potential contractors, and the Fire program. Susan O'Neil has been hired by the I&M Program and will be working on this proposal and an invasive species monitoring protocol.
- The timeline will be driven by the need for vegetation maps of individual parks based on the due dates of Fire Management Plans (FMP) and General Management Plans (GMP). Start CRLA and REDW in 2007. Start LABE and ORCA in 2008.
- Without outside funding or support, the project areas will include a one mile buffer around the park boundaries. The exception to this is ORCA which will include the potential boundary expansion (3,410 acres).
- With a few exceptions, the alliance level will be the focus of these vegetation maps. The classifications will be at a finer scale and that data can be used later. If practical, ORCA may be done at the association level. Sensitive, rare and other significant habitats within other parks may be mapped at the association level (e.g., grasslands at LABE).
- Invasive species and rare species will be noted in all plots even if < 1% cover. This data can be used in other Network projects and monitoring efforts.
- The most recent version of the proposal will be kept in a folder on the ftp site to provide access to people for edits, comments, additions.

- A final version will be sent for park, program review by Sept 1. A final proposal will be sent to Karl Brown on Sept 15.

Action Items:

- **Ken Stumpf** of GRS will provide the LAVO work plan and budget to Susan O'Neil.
- **Robin Wills** will work with local Fire Management Officers to contact the USFS about regional collaboration, funding and potential project expansion.
- **Leonel Arguello** will meet with adjacent State Park units about collaboration and funding.
- **Susan O'Neil** will work with **Dennis Odion, Andy Duff** and park staff to develop the timeline, budget for CRLA, LABE, ORCA.
- **Leonel Arguello** will look into potential partners at HSU for vegetation classification.
- **Leonel Arguello** and **Ken Stumpf** will work on a budget and timeline for REDW based on specific park goals.
- **David Larson** will look into NW Forest Plan funding. Typically this funding goes to Olympic NP.
- **Susan O'Neil** will work with individual parks on additional park specific objectives.
- **Andy Duff** and **Susan O'Neil** will compile existing datasets and imagery for assessment.

Detailed Summary for Administrative History:

The meeting began at 1:00pm in Redding, CA on June 12. Following introductions, Susan O'Neil went over the goals and objectives:

Goal: Complete vegetation maps following USGS/NPS guidelines for all KLMN parks.

Objectives for this meeting: Define the objectives for each vegetation map within KLMN; develop a timeline for the vegetation mapping projects in KLMN parks; determine the boundaries of the project for each park; draft the roles and responsibilities of each party in completing the maps; agree to the structure of a funding proposal including commitments to review and a submission date.

Susan O'Neil gave a presentation outlining the process, standards and products expected from each NPS vegetation map project. All details followed from the four guidance documents available on the NPS Vegetation Mapping Program website: <http://biology.usgs.gov/npsveg/>. The purpose of the presentation was to provide enough background to bring everyone up to the same understanding and expectation of vegetation mapping projects in NPS units.

Todd Keeler-Wolf of CA Fish and Game and Julie Evens of CNPS gave a presentation on vegetation classification and the Rapid Assessment field method they use in California. They reviewed the National Vegetation Classification System (NVCS), Natureserve website, potential changes to NVCS with the updated International Vegetation Classification (IVC), and sample location selection using biophysical units. They gave a synopsis of the multivariate statistics used to complete a vegetation classification and how that fits into the "fuzzy logic" model of accuracy assessments.

Russ Weatherbee, GIS-Wildlife Biologist for WHIS, presented the results of the WHIS vegetation classification and map. The project was funded by the Fire Program. The project was completed by Humboldt State University with Principal Investigators in the Forestry and Environmental and Natural Resources (Spatial analysis) departments. In addition to providing the park with a vegetation map and classification, the researchers were interested in testing the utility of Feature Analyst® software. The classification done in 2003 resulted in 48 associations and types. The spatial analysts merged these down to 30 associations and added 6 that were not in the previous classification for mapping. The overall accuracy of the association level map was 56%. When aggregating to 20 alliances the overall accuracy was 70%. An acceptable accuracy of over 80% was reached upon

a further aggregation to 17 classes, justified by combining alliances that were often confused and are functionally similar. Russ felt that from a park management perspective, the 17 classes would be useful.

For the rest of the afternoon and the following morning, the park managers discussed their objectives and strategies for vegetation mapping. Questions were answered via conference call during two short conversations with Karl Brown from the National Vegetation Mapping Program. **Key points/discussions:**

- We are currently developing a unified approach with the proposal but each park will have its own specific objectives and potentially changes to methodology because they are so different.
- The proposal should meet the needs of National Vegetation Mapping Program and the Fire Program so that we can use it to request funding from both sources.
- A Network proposal is preferred to look at the parks holistically. It looks better for collaborators. Within the proposal, some parks may be on-going and others are new starts.
- The National Program typically funds \$4 million in park mapping projects each year with \$2.8-\$3 million for on-going projects and \$1 million for new starts.
- The vegetation mapping program cannot fund all of the fire and fuel data needs. It is more efficient to have one crew collecting data for both programs, but Fire will have to provide some funds for the extra effort in the field.
- Robin Wills said that end of the year funds are the most likely source; thus we should have a plan ready to accept and allocate those funds when they become available.
- A scoping meeting should be held for each park/group of parks prior to the commencement of a project. Karl Brown is interested in attending these meetings. He suggests 2-3 months notice for each meeting with our partners and collaborators involved in setting the date.
- The resident resource person at each park will work closely with whoever does the classification of each park.
- Knowing who the Principal Investigators will be prior to submitting the proposal is necessary for being prepared to start in FY07 if funding is granted.
- For larger parks the goal is \$1.00 - \$1.25/acre. This is often more expensive in smaller parks. Russ estimated that WHIS was much higher, up to four times the target cost.
- Robin Wills told the group that Calvin Farris and Tim Bradley will be available to participate and assist on these projects.
- Dennis Odion's CV was reviewed and the fact that he did a similar project on the Modoc Plateau was discussed. There was consensus that Dennis Odion and Andy Duff from Southern Oregon University (SOU) would be appropriate for completing the projects at CRLA, ORCA, and LABE. Given that Dennis is currently working on a vegetation monitoring protocol for the Network and the fact that he has experience with fire, ecology and botany makes him particularly qualified. There was concern about involving two additional professors from SOU that people were not familiar with if Dennis does not receive P.I. status from the University. These other professors might be involved in helping to involve students with the project which is a goal of the University.
- The I&M program wants a comprehensive, specific plan for each park so that there aren't surprise workloads for anyone. This has been a problem with the LAVO map.
- With a few exceptions, the alliance level will be the focus of these vegetation maps. The classifications will be at a finer scale and that data can be used later. If practical, ORCA may be done at the association level. Sensitive, rare and other significant habitats within other parks may be mapped at the association level (e.g., grasslands at LABE). This may involve going to the association level, using a smaller mapping unit than 0.5ha or both in target locations.
- Photo interpreters and ecologists working on the classification should be involved in fieldwork as part of the iterative process. The polygons should be delineated using some ecological reasoning, not just visual differences in imagery.
- People felt that John Stuart and his graduate student did an excellent job with the classification at WHIS. Perhaps we need to look beyond CNPS particularly for situations where ecologists are very familiar with

the parks. Leonel will look into using HSU for the classification at REDW in collaboration with Geographic Resource Solutions.

- A REDW team headed up by Leonel will work closely with Geographic Resource Solutions. A team of park, I&M and Fire program staff and will work closely with the SOU team.
- We would like to have integration with the wetlands assessment being conducted by Cheryl Bartlett.
- Comparing a 2006 map to those that might be completed in the future will allow us to detect certain landscape level changes such as: changes in composition due to disease (*Phytophthora* spp.) and infestations (beetles), range expansions due to climate change if it is drastic, changes in ratio of native to non-native cover (grasslands at LABE).
- Classifications are of value for each park, particularly CRLA which represents a relatively undisturbed portion of the Cascades.
- The vegetation maps and associated data are important to each park for three major purposes: major vegetation groups, structure information for wildlife habitat and structure information for fuels (these last two are very similar but there may be some additional information collected for specific wildlife modeling especially fishers at REDW and ORCA). More wildlife specialists need to be involved in this process for each park.
- Data on vertical and horizontal structure are important for both wildlife habitat and fuels.
- WHIS did not have much information on floristics or structure per polygon. Other parks would like to have this information in the GIS. At Lassen all cover characteristics will be part of the GIS, so that different components can be mapped for different purposes.
- Chris Wayne recommends using PDAs and ArcPad in the field. CNPS found that this was not efficient.
- The current fuels data is variable between parks in the Klamath Network. There is a lot of fuels data for Lassen.
- For the parks in KLMN, only Lassen has FARSITE models. This is needed for other parks. We are not just interested spread, but severity and fire effects are also of interest. The vegetation maps can provide volume of fuel, type and arrangement. Karl warned that based on the experiences at Rocky Mountain NP and Glacier NP, it is extremely difficult to get this data out of a vegetation map because the sampled data represents other polygons on the landscape. It gives you a generalized map with high variability due to point samples.
- Typically 5 or more samples are needed per class to provide enough data for classification. If we attempt to collect 4 samples per class that might give us more time to collect fuels data and still classify at the alliance level. We would need a compelling argument in the proposal to do this. The time saved by doing 4 rather than 5 samples might still not provide enough time to collect all of the fuels data. We should stay focused on a good classification for each park. Classify at the alliance level and let the accuracy assessment determine what level is appropriate for mapping (goal is currently alliance).
- We may have different fuel needs for each park because the current data is so variable.

Timing/schedule/logistics for projects:

- CRLA would like a map or draft by FY08 as they write their FMP update. FMP needs to be done in FY09.
- LABE and ORCA could be one year later for the FMP. FMP needs to be done by FY10. ORCA may lose their GIS person by FY09. LABE will be burning a lot next year, so it would make sense to do the map afterwards. This may mean purchasing new imagery.
- REDW would like a project to start as soon as possible. GRS can start REDW classification fieldwork in 2007 as the accuracy assessment is done at Lassen. Two different teams do the field work for the classification/mapping and the accuracy assessment data collection.
- Fieldwork at higher parks, CRLA, won't typically start until June. ORCA and LABE are typically appropriate to sample in April/May. This might allow for some sampling in different parks within the same year.

- Because of access problems at CRLA, a team would likely stay there for the season with backcountry trips for remote sampling. CRLA has housing available but it is not funded. CRLA can also provide GIS support throughout the project, a terrestrial ecologist for 1.5 PP and a GS-6 botanist for 1 PP.
- ORCA can contribute housing, potentially one vehicle and 30% of a GIS specialist.
- LABE has a research center that can be used as housing if it is planned ahead of time.
- REDW would hire and supervise four crew members (2 teams of 2) to work directly with GRS. GRS would provide training and logistics. This saves on overhead by not hiring contractors and ensures the project is integrated with the park. Other parks may also consider this structure to save money, but this may be easier in parks with significant natural resource staff.

Collaborators:

- Karl Brown is very interested in having us work with adjacent National Forests. Many districts are interested in characterizing their vegetation (particularly the Diamond Lake District north of CRLA). In the past the USFS has not used the NVCS to describe their vegetation. If they don't contribute money or personnel, we should at least have them involved so they know what we are doing and our methodology.
- There is a new process for budgeting Fire funding across agencies. The Fire Management Units (FMU) are what we have to consider for collaboration/funding. Most FMUs have smaller blocks within them that might be more appropriate for collaboration/expanding our project area.
- It will be difficult to contact people before the proposal is due to Karl Brown. We can make adjustments and add details after it has been submitted.
- REDW will most likely work with State Parks. The Green Diamond private lands are not appropriate to involve.

Lassen Project

- Starting this field season with GRS working on the field data collection and GIS. Still working on who will perform the classification.
- CNPS gave a time estimate that might not fit in with the project timeline – 2 months for classification only. CNPS is also concerned about using the GRS transect methodology in a classification. Most people felt that it would work and perhaps be better due to providing quantitative cover data rather than ocular estimates. The GRS methodology is longer than the rapid assessment method (2-2.5 hours). There are 100 points in a diamond or triangular transect.
- Ken Stumpf has been working with Calvin Farris and Robin Wills on collecting fuels data.
- The experience at Lassen was that the USFS was not interested and did not return telephone calls regarding the vegetation map at the park.
- The current timeline is to collect field data this season for the classification and photo interpretation. A second team will collect the accuracy assessment data summer of 2007. This timeline assumes that the classification and photo interpretation will be completed during the winter/spring of 2006/2007.